FUTURE BUILDING INSIGHTS SUMMIT 2019

Non-Conforming Building Products

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Provision of Research to Improve the Evidence Base Relating to Non-Conforming Building Products

The question

- What is the extent of non-conforming building products?
- What is the risk profile of non-conforming building products?
- What policy interventions are needed?

Extant definitions

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Non-conforming

- Non-conforming building products (NCBPs) and materials are those that: purport to be something they are not; do not meet required standards for their intended use; or are marketed or supplied with the intent to deceive those who use them.

Non-complying

- Non-compliant products (NCP) and materials are those that are used in situations where they do not comply with the requirements of the National Construction Code (NCC) other relevant laws and Australian Standard

"A Guide to **AUSTRALIAN BUILDING PRODUCT CONFORMITY"**
NSW Government on behalf of the Senior Officers' Group , April 2018

Explanation

- To put it simply, NCBPs are ‘bad’ products, while NCPs are products ‘used badly’.
- A building product can be both non-conforming and non-compliant

“A Guide to **AUSTRALIAN BUILDING PRODUCT CONFORMITY”**
NSW Government on behalf of the Senior Officers' Group , April 2018

Clarification

- A building product that is labelled or described as being non-combustible but which is combustible is a non-conforming building product.
- A building product that is combustible, and described as such, but is used in a situation where a non-combustible product is required under the NCC, is not fit for purpose and is a non-complying product.

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Our approach

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First phase

- **Stage 1**: Direct Enquiry with stakeholders from states and territories and the federal government
- **Stage 2**: Literature review to find evidence of the global extent of non-conforming building products
- **Stage 3**: Root Cause Analysis for the claim of 'wide spread' non-conforming products in Australia

Second phase

- **Stage 4**: Challenging the definitions of terms used in relation to building products
- **Stage 5**: Building a new theoretical framework based on quality assurance principles
- **Stage 6**: Development of recommended solutions for change

Emotive challenges

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Grenville tower greatly raised community interest in NCBP

Senate Enquiry

NON-CONFORMING BUILDING PRODUCTS

SENATE REPORT

Phase 1

Working with the existing definitions
and looking for evidence

Stage 1: Direct Enquiry

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- We sought “evidence” of NCBP
- government and industry stakeholders from states and territories and the federal government
- Industry participants

- We did not find reliable evidence. There was no smoking gun

Stage 2: Literature review

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"About 85 per cent of the 600,000 tonnes of fabricated steel imported into Australia every year is non-compliant"!

Farrelly, E (2019) Cracks in the façade of apartment life. *The Age*, 05 January 2019

- 2015: *Strategies to Address Risks Related to Non-conforming Building Products* (SOG)
- 2015: *Building Product Compliance Survey* (HIA)
- 2016: *Report of the Senate Economic Sub-committee Inquiry into Non-conforming Building Products*
- 2017–November: Non-conforming Products Survey 2 (MBAQ).

Stage 2: Literature Review

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- Few actual examples documented
- Almost entirely hearsay
- Reliance on opinion surveys

- Again, we did not find reliable evidence. There was no smoking gun

Stages 1&2: summary

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How can that be?

- Anecdotal evidence only
- Cases are not investigated or reported
- Some evidence of anti-competitive behaviour
- Very few examples could be named

So was there nothing?

- Serious social concern
- Issues in relation to specific standards:
  - External cladding and Fire rating
  - Concern with AS4100 (Steel)
- Many “other” examples*
  - *Others are supply chain behaviour issues

Examples of Non-conforming Product

Photo 3
Silicon Welds

Photo 4
Diagonal chords on this bridge truss when cut were found to be filled with water. This is extremely unusual and is thought possibly to have been deliberate to build up the weight of the structure to have a mass within overall specification.

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Misleading concepts

"A Guide to **AUSTRALIAN BUILDING PRODUCT CONFORMITY"**
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Stage 3: Root cause analysis

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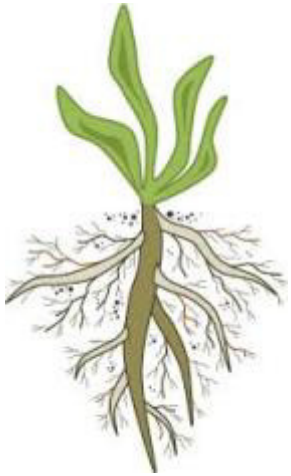

Context

- Globalisation
- Trade treaties
- Opening industry to international competition
- Global financial crisis

Response

- PM Taskforce on manufacturing (2012)
- *The quest for a level playing field: The non-conforming building product dilemma* (AIG, November 2013)
- Senate Enquiry commenced 2015

Stage 3: Root cause analysis

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AIG report

- "Ai Group revels widespread use of non-conforming products"
- "Non-conforming products 'widespread' across building sector"
- "Building and construction industry full of non-conforming products".

Based on

- Opinions and anecdotal evidence only
- Poor research design
- the empirical research reported in *The quest for a level playing field: The non-conforming building product dilemma* does not meet the basic requirements for research validity and reliability.

Stage 3: Root cause analysis

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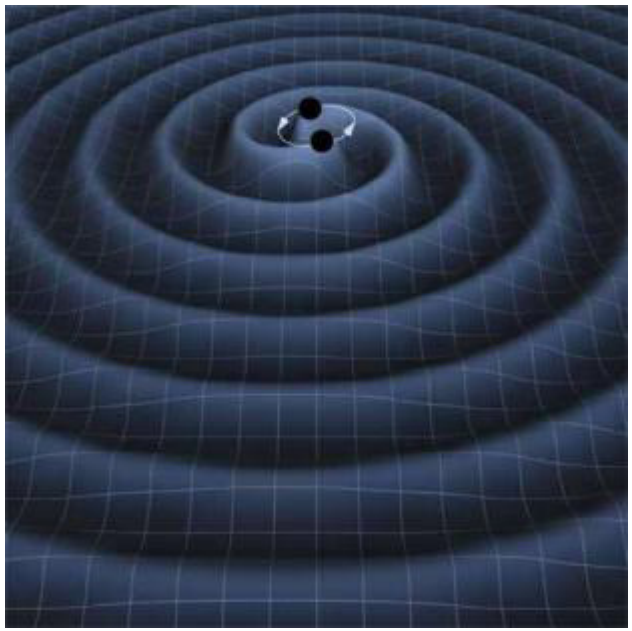
Senate Enquiry etc.

- Most claims of non-conforming products can be traced back to the AIG report
- So there are countless claims, most relying on a faulty research report for evidence



Terms too confusing

- The definitions are too confusing to the public and industry
- No one seemed to know whether faults were non-conformance or non-compliance
- Legislative response also seemed to have a bet each way and mixed the terms

- ‘A significant aspect in this area is the common interchangeable use and misuse of different terms (e.g. “compliant”, “conforming”, or “meeting” in regard to Standards and Codes)’

  The Australasian Certification Authority for Reinforcing and Structural Steels (ACRS)

We decided to look at the problem in a different way

Phase 2

Challenging the existing definitions and
a developing new theoretical framework

A new focus

- While there is little evidence of NCBP,
- There is widespread concern with products
- So the problem of non-performing building products must be solved

Products must perform

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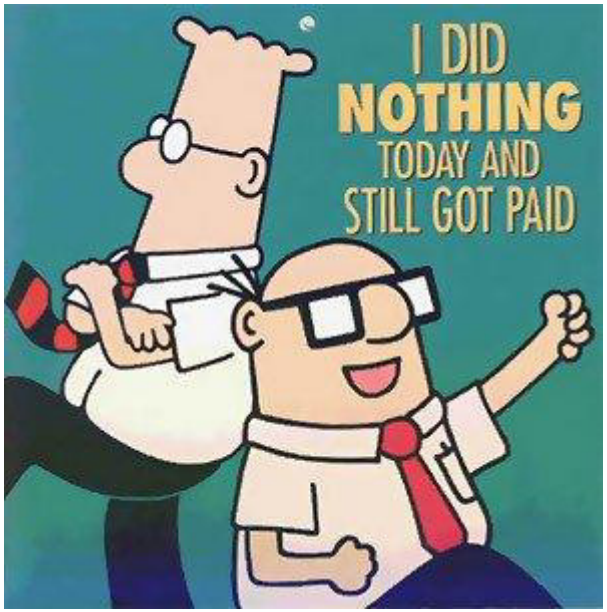
Performing

Non-performing



Stage 4: Challenging the terms

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1. Performance

- **Performing building product**: A building product, material or substitution that, at installation, meets the performance requirements of the National Construction Code.
  - *This is a fit for purpose building product.*
- **Non-performing building product**: A building product, material or substitution that, at installation, fails to meet the performance requirements of the National Construction Code.
  - *This is a not fit for purpose building product.*

Stage 4: Challenging the terms

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2. Compliance

- **Compliant building product:** A selected building product or material that was designed to comply with the requirements of the National Construction Code, other laws, or required Australian or relevant international standards.
  - *This is a good faith purchase of a fit for purpose product that meets requirements.*
- **Non-compliant building product:** A building product or material that is inappropriately selected, and which was not designed to comply with the requirements of the National Construction Code, other laws, or required Australian or relevant international standards.
  - *This product is not fit for purpose and should not be purchased or used as a substitution product.*

Stage 4: Challenging the terms

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3. Conformance

- **Conforming building product:** A building product, material or substitution that, at installation, meets the performance of a selected compliant building product.
  - *This is a fit for purpose building product.*
- **Non-conforming building product:** A building product or material that, at installation, fails to meet the performance of a selected compliant building product.
  - *A non-conforming product could be the result of manufacturing defects, damage, product misrepresentation or false paperwork. This product is not fit for purpose.*

Stage 4: Challenging the terms

Note

- Current definitions equate non-conformance with product substitution
  - Providing an alternative product to a compliant product
  - This is an important industry practice
- However, substitution should still require compliance

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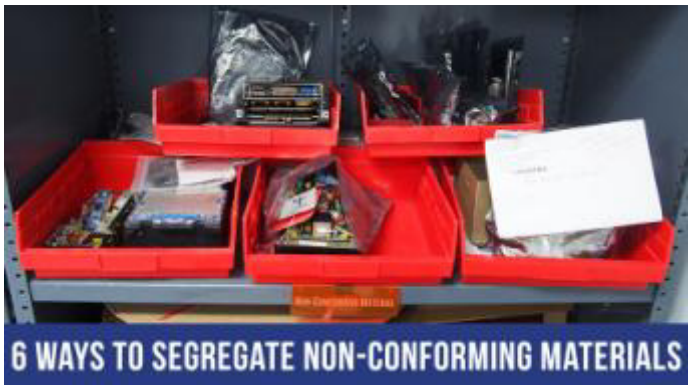
Phase 5: A new framework

- Adopt principles from manufacturing
- A manufacturing non-conformance is an unexpected event that occurs in the manufacturing process that deviates from a set standard or requirement.



Phase 5: A new framework

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- It is reasonable to conclude that, compliance relates to the satisfaction of code and standards requirements through the *compliant product design*. This differs from conformance which relates to the manufacturing processes that *create conforming products* that conform to their compliant design. Similarly the supply network must *supply conforming products* to the project.

- A compliant product design (and test)
- A conforming product manufactured
- A conforming product supplied

Three pillars

- Design compliance
- Manufacturing conformance
- Supply conformance

- And clarity!

Phase 5: A new framework

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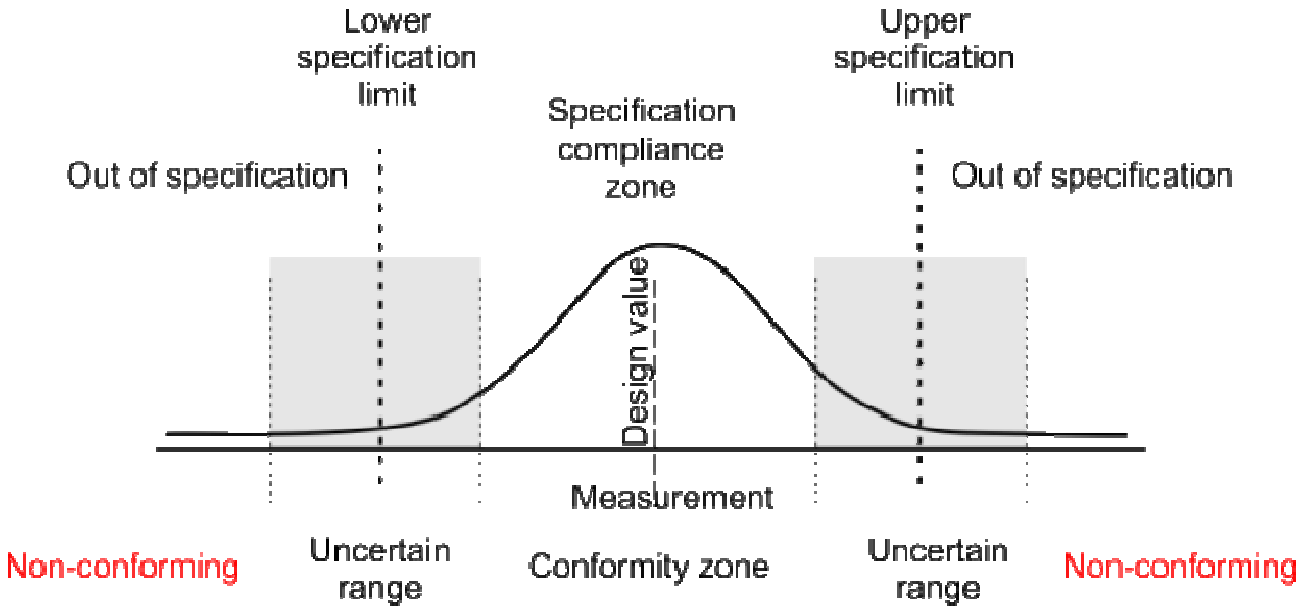
Compliance and conformance



Phase 5: A new framework

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Demand side

- should have knowledge about the specific needs of the building and its design context; they should know what product is needed and therefore what is fit for purpose

Supply side

- are aware what a specific product has been designed for, and
- what the technical performance of their product is

Phase 5: A new framework

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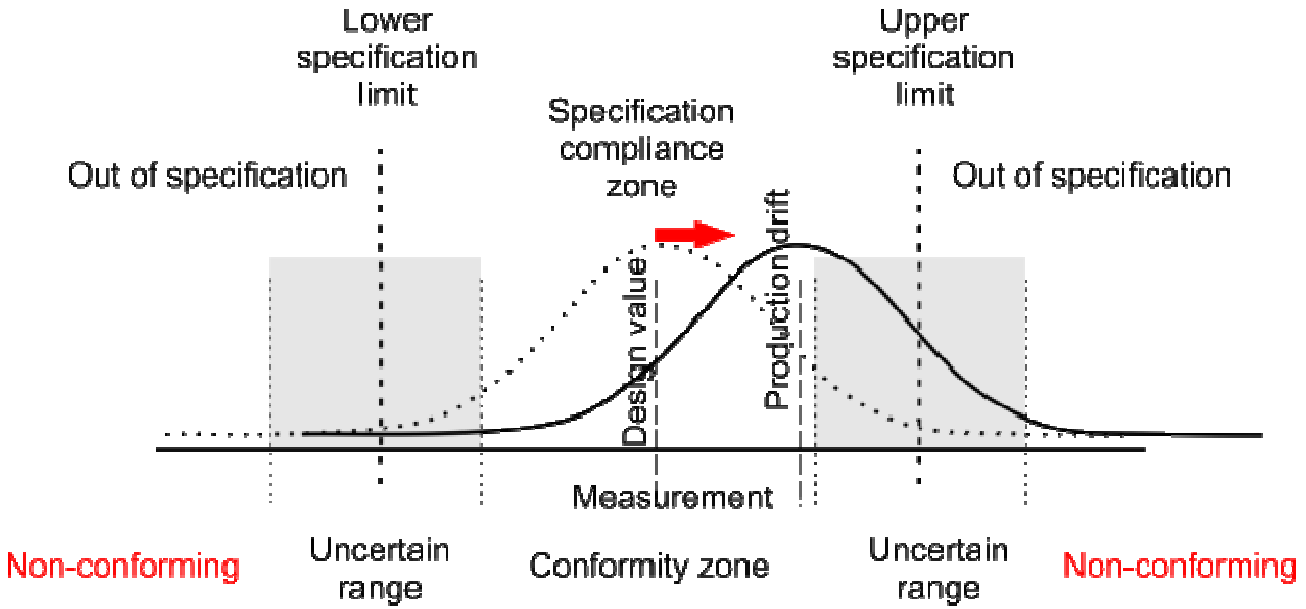
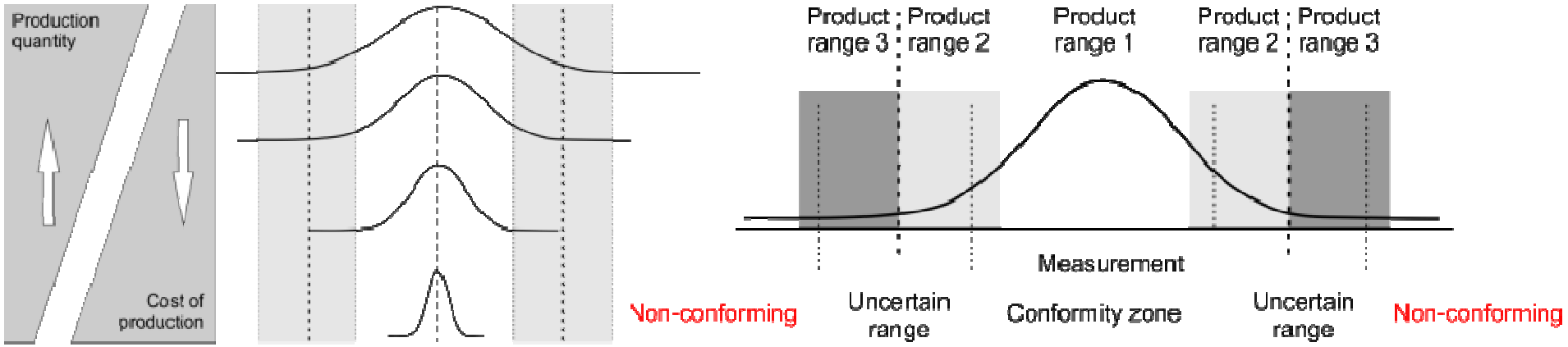
Non-conforming product: manufacturing deviation (supply side



Phase 5: A new framework

Non-conforming product: quality ranges (demand side)



Phase 5: A new framework

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Demand side

- Non-compliant product: non-compliant selection
- Non-compliant product: non-compliant substitution
- Non-conforming product: inappropriate installation

Supply side

- Non-conforming product: product
- Non-conforming product: falsification of certification
- Non-conforming product: testing errors
- Non-conforming product: product regrading during supply
- Non-conforming product: product/documentation swapping in supply

Demand-side responsibility

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Selecting a complying product

- The contractor must choose a product which complies with the requirements of the NCC and the required standards.

Selecting a conforming product

- A product substitution must still have design compliance
- The product must be manufactured to produce compliant products
- The supply chain must deliver compliant products

Supply-side responsibility

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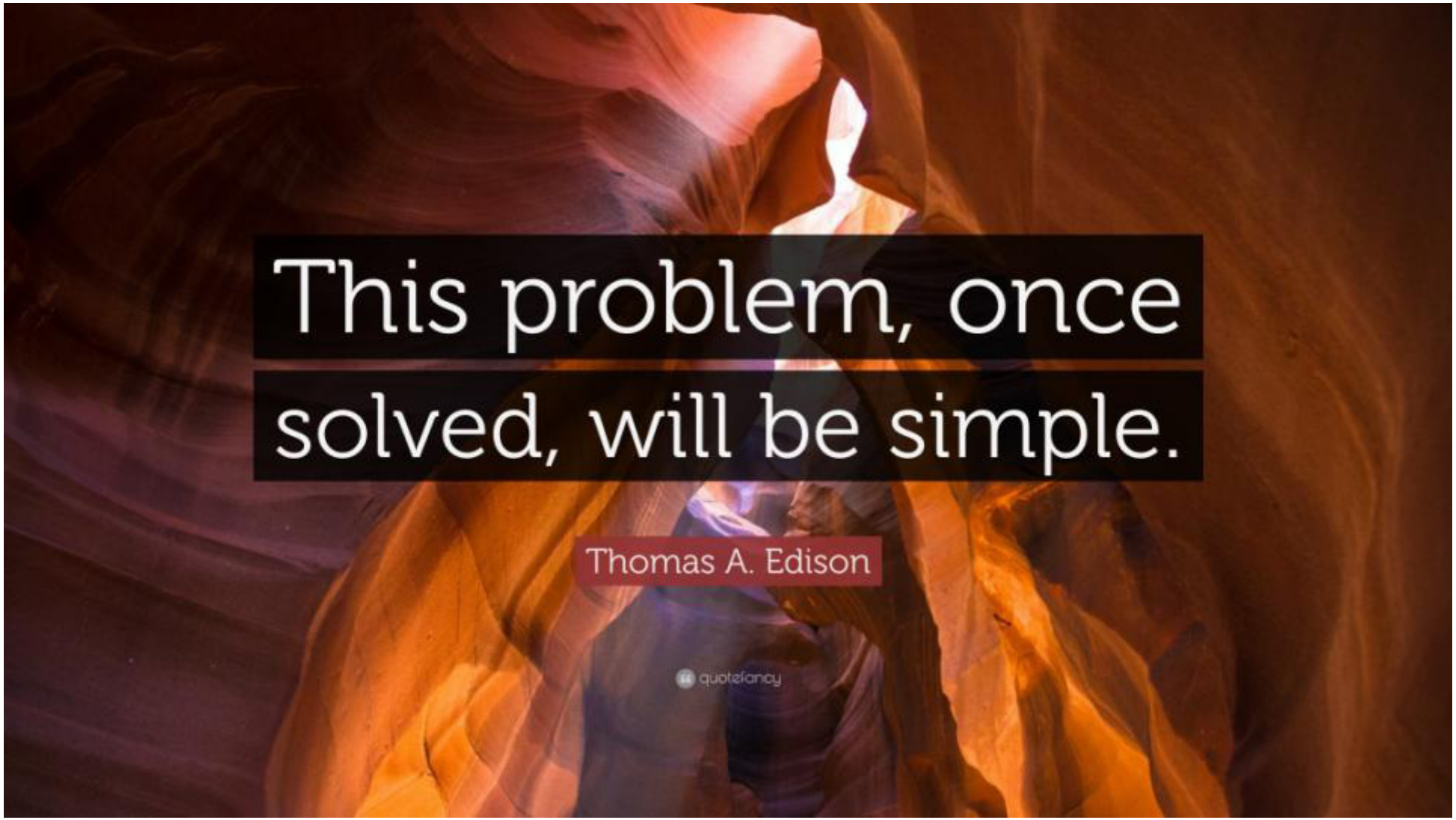
Providing a complying product

- Manufacturers have an ethical responsibility to be accurate in their provision of information.

Providing a conforming product

- Manufacturers have a responsibility to provide a conforming production and delivery process


This problem, once solved, will be simple.
Thomas A. Edison
quotefancy

Phase 6: Recommendations

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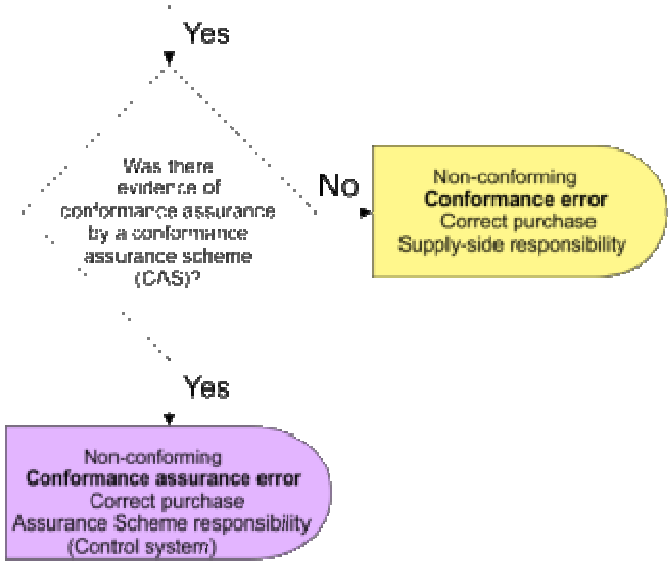
Non-performance

- Was there evidence of design compliance
- Was there evidence of conformance assurance



Phase 6: Recommendations

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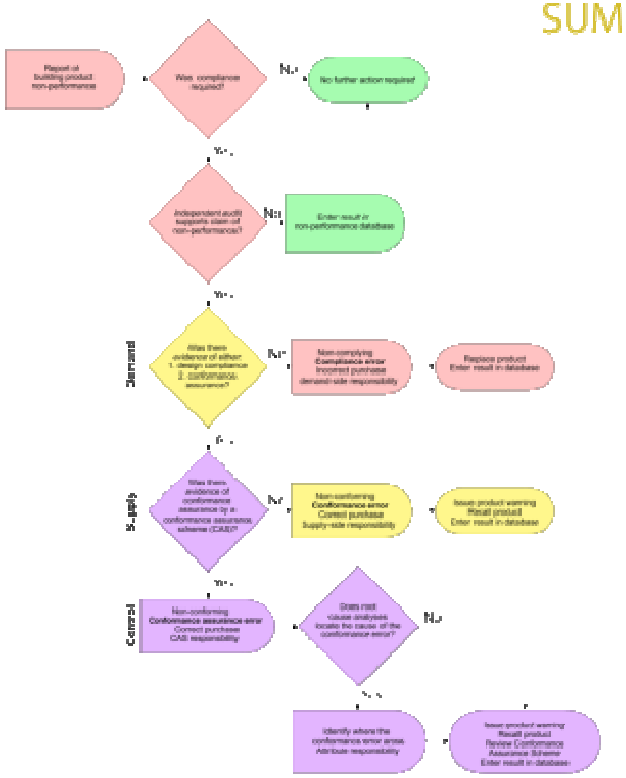
Building product non-performance assessment

- Demand
- Supply
- Control (conformance assurance)



Phase 6: Recommendations

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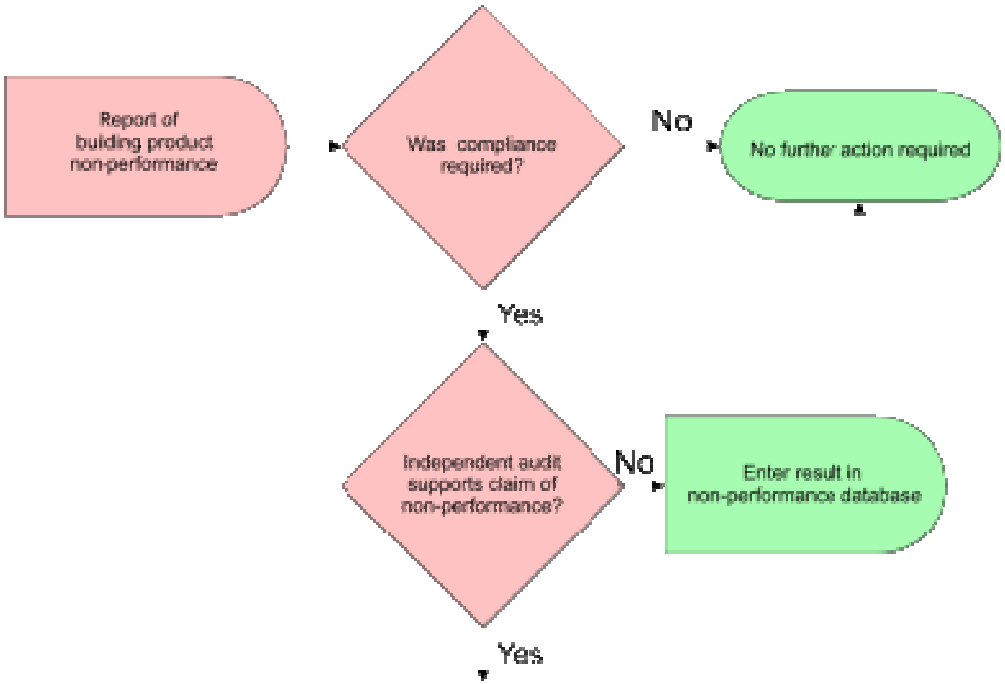
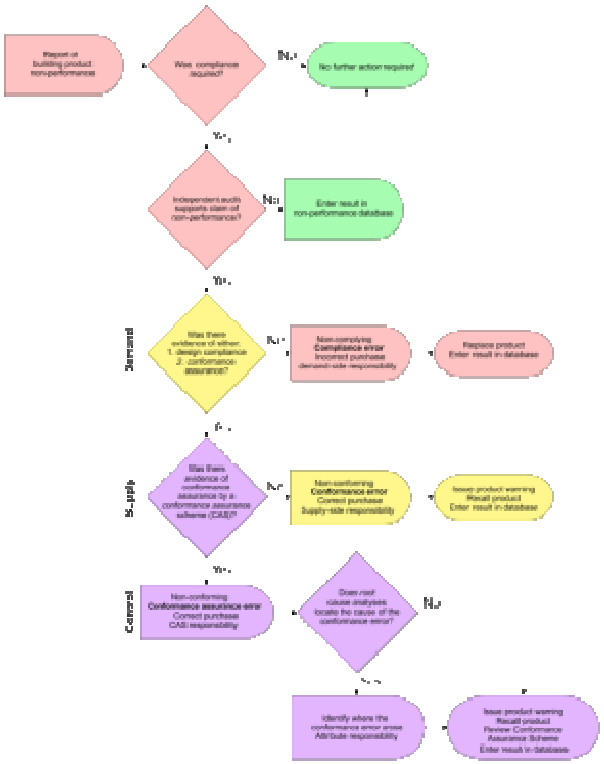
Building product non-performance assessment





Phase 6: Recommendations

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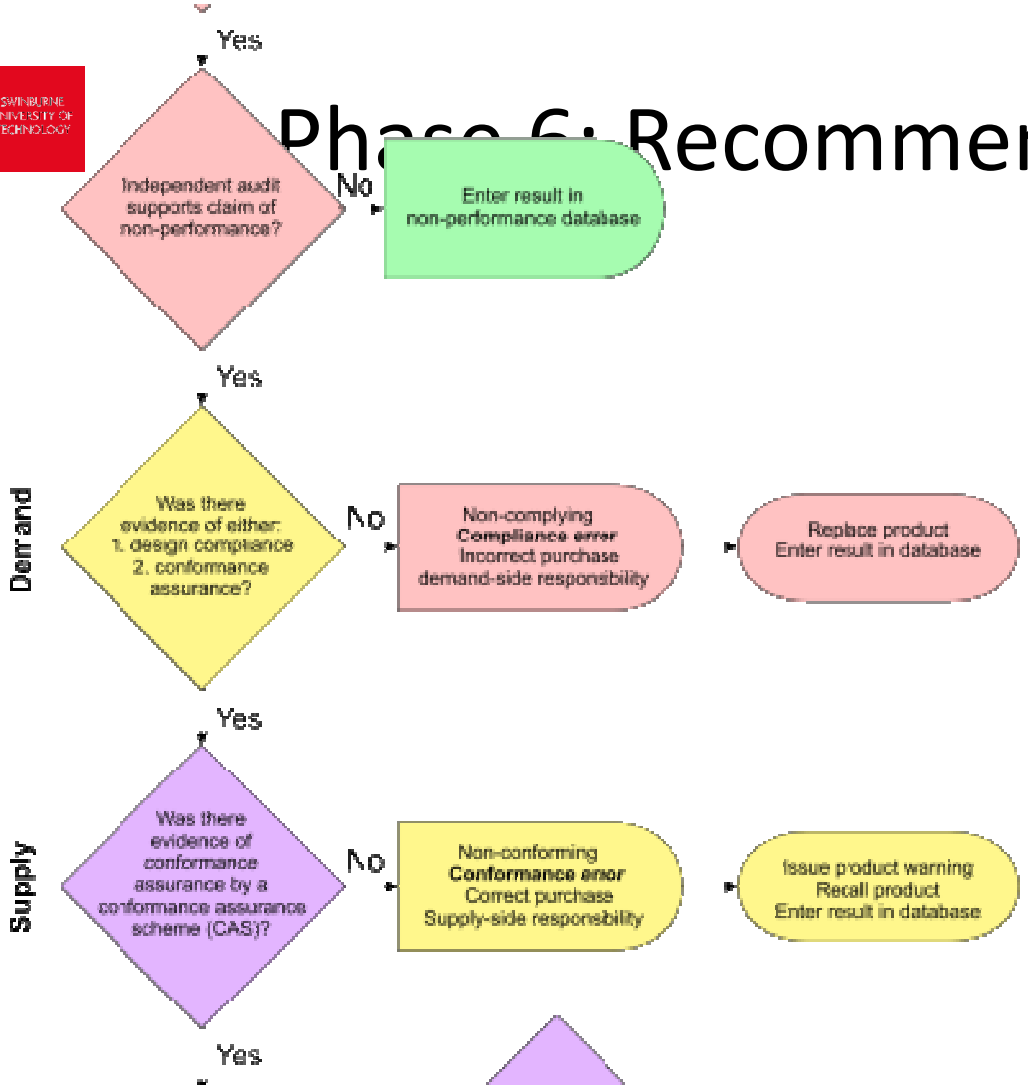

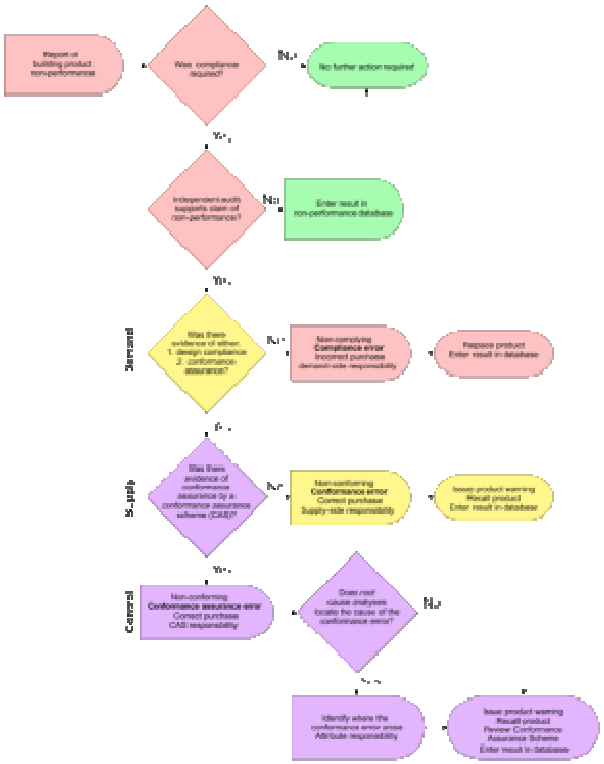

Phase 6: Recommendations

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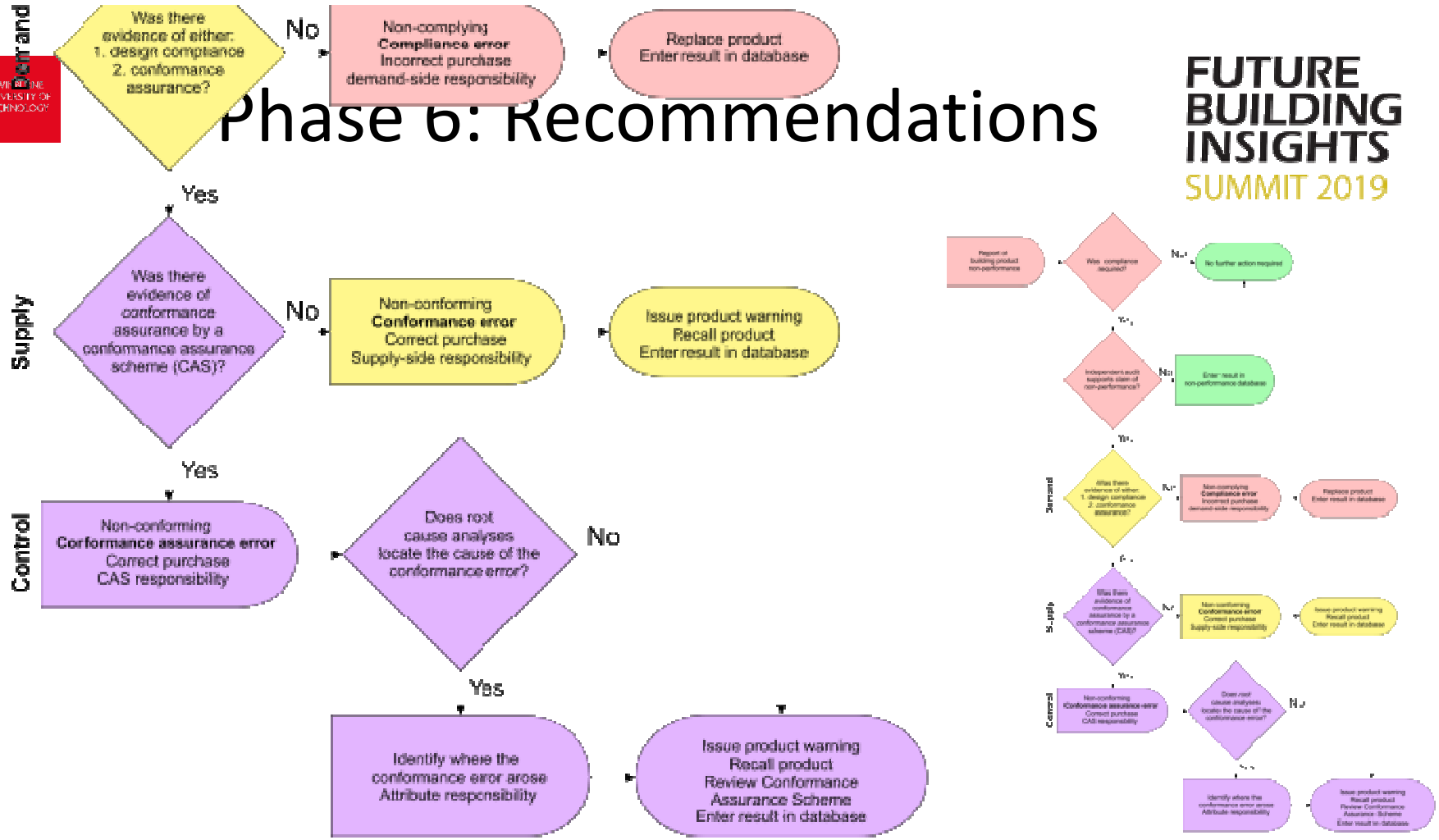

Phase 6: Recommendations

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Conformance Assurance Schemes

- **Certificate of Design Compliance**
  This involves approving the product design as meeting the performance requirements of the NCC including a desktop analysis of design plus testing of sample product.
- **Certificate of Manufacturing Conformance**
  This involves approving the manufacturing process quality systems plus testing of a range of product and on-going random sampling and testing, with the frequency being risk dependent.
- **Certificate of Supply Conformance**
  This involves assessment of the supply arrangements for quality processes to ensure manufactured product is what is delivered. Ordinarily, this could be expected for major suppliers and importers of product. Block chain processes would be very effective for this function.

Phase 6: Recommendations

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Product Risk profile (PRP)

- The purpose of the Product Risk Profile is to identify where risk lies and what processes are in place to manage that risk.

Component or System	Product	Consequences of non-performance	Deemed to Comply?	Evidence of Compliance	Evidence of Manuacturing Conformance	Evidence of Supply Conformance	Conformance Assurance Scheme	Other Conformance Management processes
Component A	Product A1 Product A2							
Component B	Product B1							

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